4.3" LCM Product Specification Rev.P0

Customer	
Supplier	Shenzhen XinTianYuan Electronics Co.,Ltd.
Product name	4.3 寸液晶显示屏
Model	TB043-I4008G50A-00

TITLE/SIGNATURE	DATE

ITEM	SIGNATURE	DATE
Prepared	heyong	
Approved	lixiyang	

REVISION HISTORY

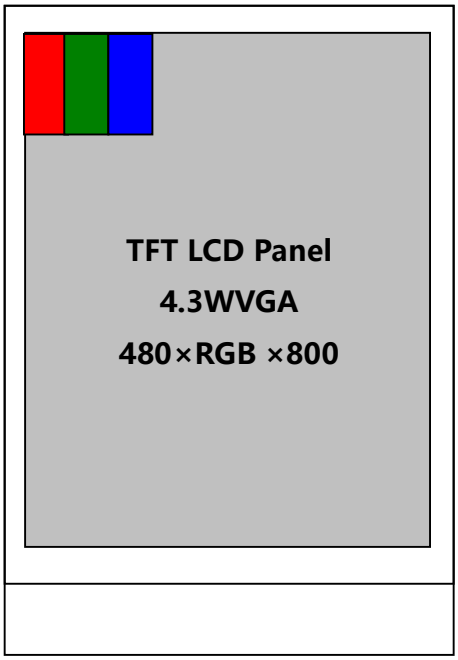
REV.	ECN No.	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		Initial Release	2022.05.18	heyong

Contents

1.0 GENERAL DESCRIPTION

1.1 Introduction

TB043-I4010G50A-01 is a color active matrix TFT LCD module using amorphous silicon TFT(Thin Film Transistors) as an active switching devices. It is a transmissive type display operating in the normal black. The TFT-LCD has a 4.3 inch diagonally measured active ar ea with WVGA resolutions (480 horizontal by 800 vertical pixel arrays). Each pixel is divid ed into RED, GREEN, BLUE dots which are arranged in title stripe and this module can display 16.7M colors.



1.2 Features

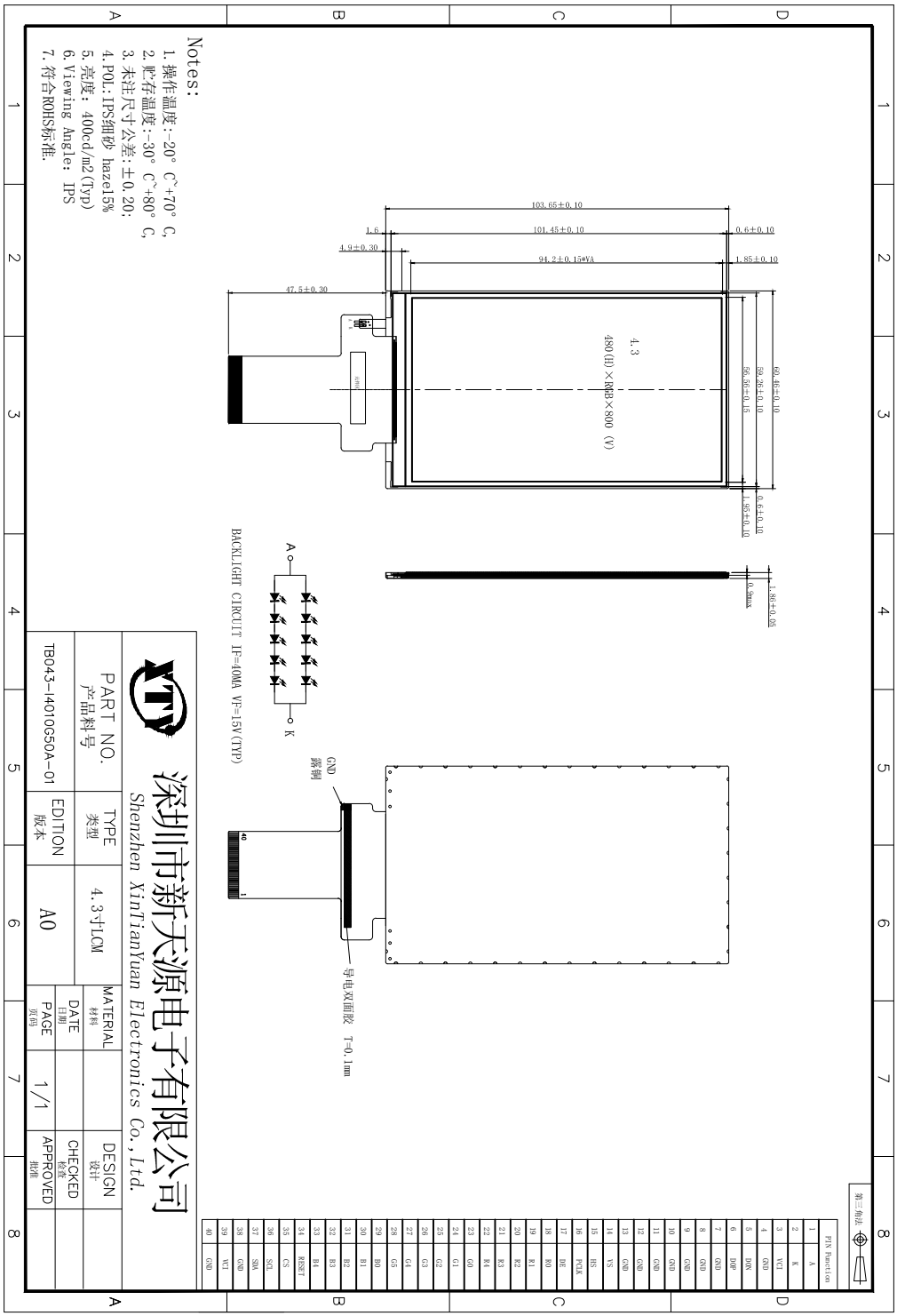
- Border (L/R/U/D) : 1.45/1.45/1.45/5.8mm
- NTSC：70% @C Light
- wide viewing angle (U/D/L/R)：80/80/80/80

1.4 General Specification

< Table 1. General Specifications >

Parameter	Specification	Unit	Remarks
Active area	56.16(H)×93.6(V)	mm	
Number of pixels	480(H) × 800(V)	Pixels	
Pixel pitch	0.039(H) × 0.117 (V)	mm	
Pixel arrangement	RGB Vertical stripe	-	
Display colors	16.7M	Colors	
Display mode	Normally Black	-	
Dimensional outline	60.46(H) ×103.65(V)×1.86(D)	mm	
Interface	RGB 40pin	-	

2.0 Mechanical Characteristics



3.0 Pin Assignment For LCD Module

No.	Symbol	Function	Remark
1	LED A	LED Anode	
2	LED K	LED Cathode	
3	VCI 3.3V	A power supply for the analog power.	
4	GND	Ground	
5	GND	Ground	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	GND	Ground	
11	GND	Ground	
12	GND	Ground	
13	GND	Ground	
14	VSYNC	Vertical Sync Input	
15	HSYNC	Horizontal Sync Input	
16	PCLK	Sample clock	
17	DE	Data Input Enable	
18	R0	Red data	
19	R1	Red data	
20	R2	Red data	
21	R3	Red data	
22	R4	Red data	
23	G0	Green data	
24	G1	Green data	
25	G2	Green data	
26	G3	Green data	
27	G4	Green data	
28	G5	Green data	
29	B0	Blue data	
30	B1	Blue data	
31	B2	Blue data	
32	B3	Blue data	
33	B4	Blue data	
34	RESET 1.8V	Reset pin.	
35	CS	Chip select signal for SPI interface operation	
36	SCL	Serial interface Clock Input.	
37	SDA	Serial interface DATA Input/ Output.	
38	GND	Ground	
39	VCI 3.3V	A power supply for the analog power.	
40	GND	Ground	

4.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. Environment Absolute Maximum Ratings> [Ta =25±2 ℃]

Parameter	Symbol	Min.	Max.	Unit	Remarks
Operating Temperature	T_{OP}	-20	70	℃	
Storage Temperature	T_{ST}	-30	80	℃	

Note:

1. These range above is maximum value not the actual operating temperature . Actual Operating temperature is no more than 40℃ and temperature refers to the LCM surface temperature ;

5.0 Electrical specifications

Parameter	Symbol	Values			Unit	Notes
		Min	Typ	Max		
System Voltage	VDD	2.5	2.8	3.6	V	
Interface Operation Voltage	VDDI	1.65	1.8	3.3	V	
TFT Gate ON Voltage	VGH	11.5	12	17	V	
TFT Gate OFF Voltage	VGL	-7.6	-12	-12	V	
TFT Common Electrode Voltage	VCOM		VSS		V	
Max Voltage of Source	VOP	-	-	5.0	V	

Notes :
1. VGH is TFT Gate operating voltage.
2. VGL is TFT Gate operating voltage. The low voltage level of VGL signal must be fluctuates with same phase as Vcom.
3. Vcom must be adjusted to optimize display quality, as Crosstalk and Contrast Ratio etc..
4. The value is just the reference value. The customer can optimize the setting value by the different D-IC

6.0 OPTICAL SPECIFICATION

6.1 Overview

The test of view angle range shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = 25±2℃) with the equipment of Luminance meter system (Gonio meter system and TOPCON CS2000/CA310) and test unit shall be located at an appro ximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to θØ=0 (=θ3) as the 3 o'clock direction (the "right"), θ Ø=90 (= θ12) as the 12 o'clock direction ("upward"), θ Ø=180 (= θ9) as the 9 o'clock direction ("left") and θ Ø=270(= θ6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the cent er of the measuring spot on the Display surface shall stay fixed. The luminance, color a nd uniformity (etc) should be tested by CS2000/CA310. The backlight should be opera ting for 10 minutes prior to measurement. VDD shall be 3.3 ± 0.3V at 25°C. Optimum v iewing angle direction is 6 'clock

<Table 5. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	75	85	-	Deg.	Note 1
		Θ_9		75	85	-	Deg.	
	Vertical	Θ_{12}		75	85	-	Deg.	
		Θ_6		75	85	-	Deg.	
Contrast ratio		CR	Θ = 0°	800	1000	-	-	Note 2
Luminance of white		L		-	400	-	cd/m²	
Color Gamut	NTSC	CIE1931	Θ = 0°	67	72	-	%	Note 4 C Light
Reproduction of color	White	Wx	Θ = 0°	Typ -0.03	0.301	Typ +0.03	-	
		Wy			0.330		-	
Response Time		Tr+Td	Ta= 25° C Θ = 0°	-	30	35	ms	Note 5

Notes : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

2. Contrast measurements shall be made at viewing angle of Θ= 0 and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state . (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

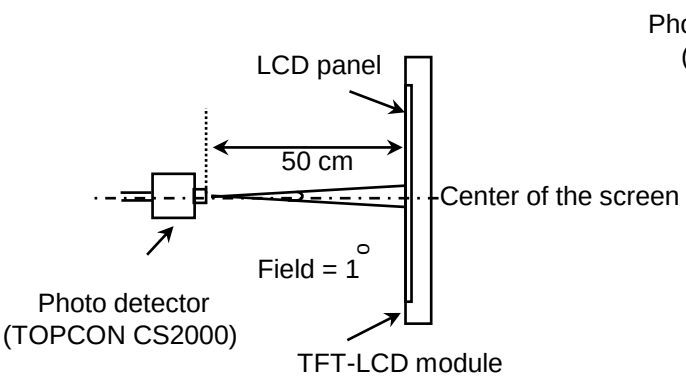
$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

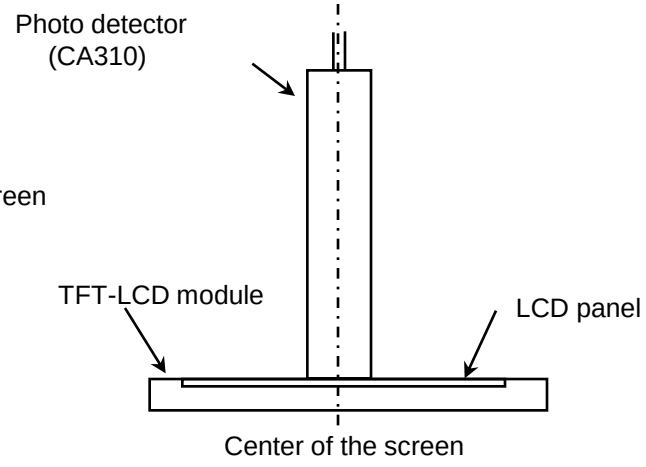
3. Luminance of white is defined as luminance values of center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in FIGURE 2 for a total of the measurements per display. The luminance is measured by TOPCON BM-7 when the LED current is set at 20mA.

4. The White luminance uniformity on LCD surface is then expressed as : ΔY = Minimum Luminance of 9 points / Maximum Luminance of 9 points (See FIGURE 2).

6.2 Optical measurements

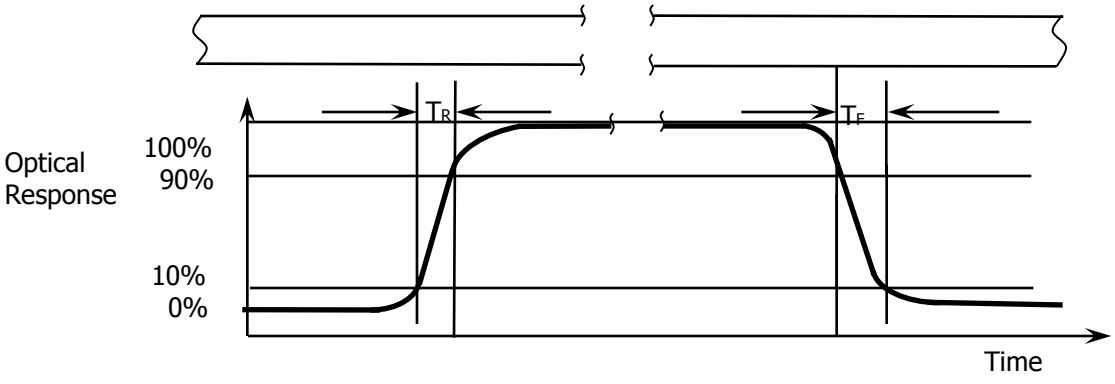
Figure 1. Measurement Set Up





View angel range, uniformity, etc. measurement setup

Flicker, measurement setup



The electro-optical response time measurements shall be made as shown in FIGURE 2. The times needed for the luminance to change from 10% to 90% is Tr and 90% to 10% is Tf.

7.0 RELIABILITY

The Reliability test items and its conditions are shown in below.

<Table 9. Reliability test>

No	Test Items	Conditions
1	High temperature storage test	Ta = 80 ℃, 72 hrs
2	Low temperature storage test	Ta = -30 ℃, 72 hrs
3	High temperature & high humidity (operation test)	Ta = 60 ℃, 90%RH, 72hrs
4	Low temperature operation test	Ta = -20 ℃, 72hrs
5	High temperature operation test	Ta = 70 ℃, 72hrs
6	Image sticking	25℃，5 x 5 chess，G127，5mins消失

Note：
After the reliability test, the product only guarantee function normally without any fatal defect (non-display, line defect, abormal display etc). All the cosmetic specification is judged before the reliablity test.